Urban Recon (ACTD)

FY03 ACTD

Mr. Mike Barwick
Joint Precision Strike Demonstrati
Project Office
(703) 704-1250
mike.barwick@nvl.army.mil

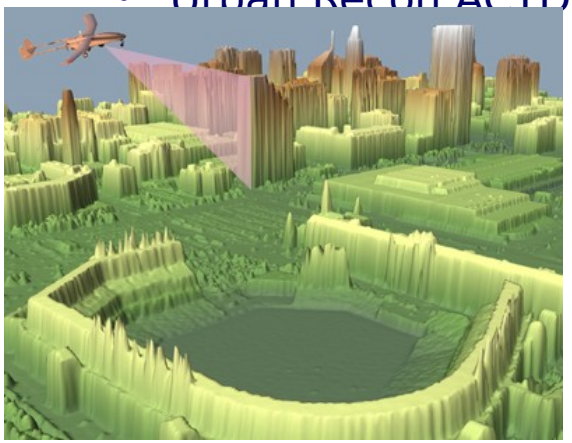
Problem

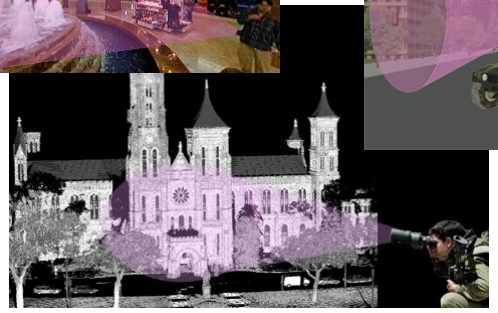
Within Hostile Urban Areas How Can We

- Rapidly Collect Current 3-D Recon Data:
  - Below the Roofline?
  - Under the Canopy?
  - Inside Buildings?
- Use 3-D Data to Better:
  - Plan and Rehearse?
  - Execute, Monitor, and Geo-Locate?
- Outmaneuver the Enemy?

Traditional Approach Would Take Months (Not Practical & Resolution Limited)

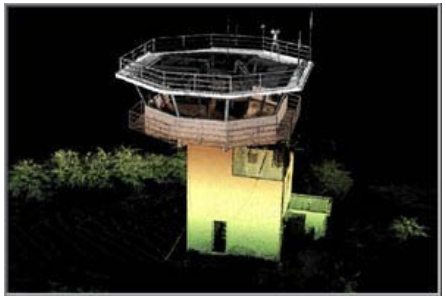
- Urban Recon ACTD to Provide Capability Within Hours





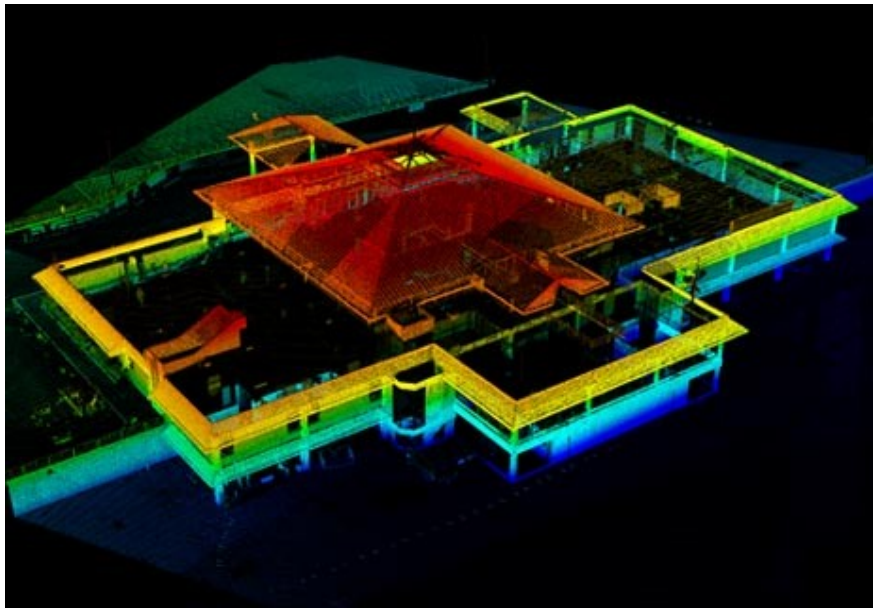
Military Need

- Urban Operations in Afghanistan, Kosovo, Somalia, Haiti, Kuwait City, … Highlight the Need for Full 3-D Detail Below the Roofline
  - Capture Doors, Windows, Setbacks, Alcoves
  - Capture Building Interiors
  - Capture Detail Below the Canopy



Airport Tower Collected from Ground

Top Down View of Tower

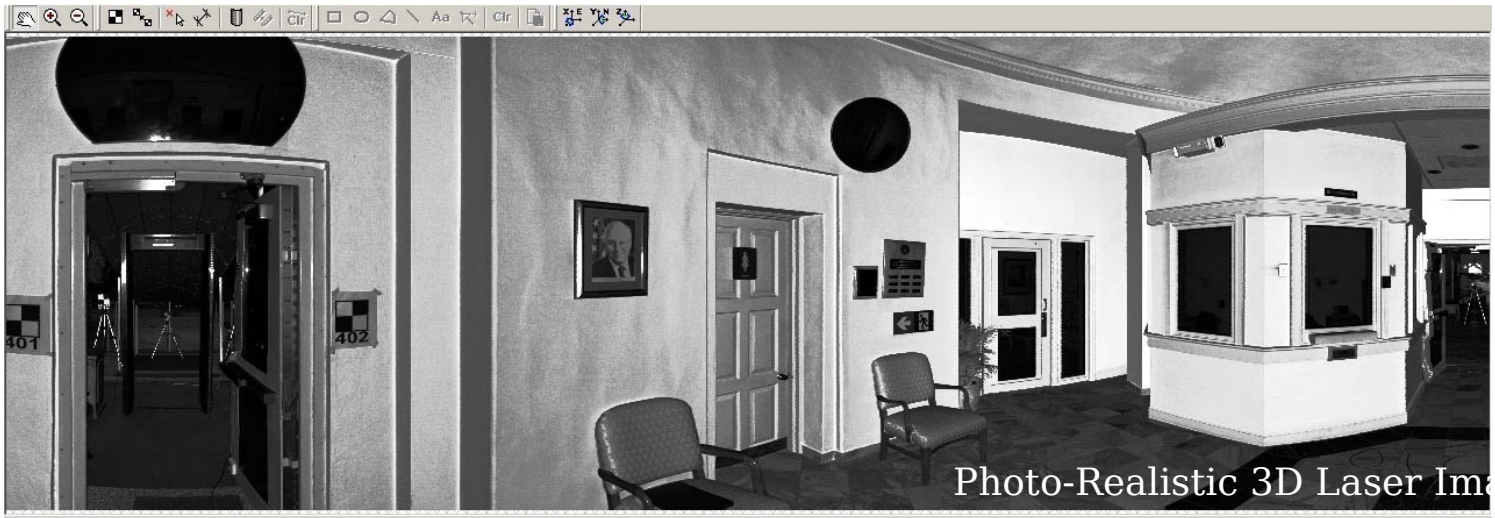


Airport Terminal Collected from Ground Level LIDAR Sensors

Minimize "Black Hawk Down" Urban Confusion

Multiple 3-D Perspectives Of Urban Recon Collected Building

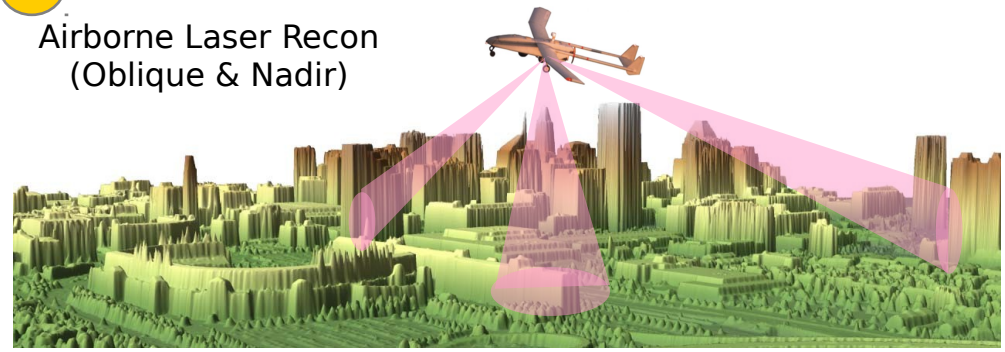
Building Interiors (2D & 3D) Using Indoor Sensors



Basic Concept

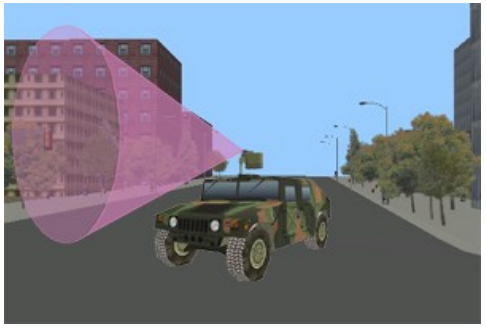
1

Airborne Laser Recon
(Oblique & Nadir)



2

3-D Laser Imaging
of Urban Setting



Terrestrial Laser
(Mounted)

Terrestrial Laser
(Dismounted)

Integrate Airborn
& Terrestrial Data

Mission Planning & Rehearsal

3

3-D Urban Visualization
Urban Decision Aids
* Urban Mobility
* Cover & Concealment
* Perimeter Defense
* Vulnerability Assessment
* Obstacle Avoidance
* BDA
* etc.

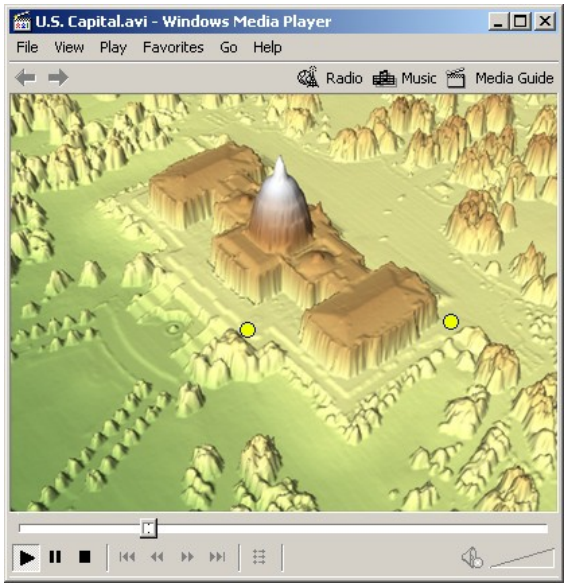
+

Live Situational Awareness

4

* Dynamic 3-D DI Geo-locator

Portable Computing Technology
3-D Situational Awareness



Blue Force Tracking

Operational Concept

Urban Recon ACTD

Field Collection

Common Media (i.e. CD, DVD)

Airborne Data Processing

Terrestrial Data Processing

Tactical Operations Center

Archive & Distribution (NIMA)

Field Collection

Warfighter

Mission & Objectives

- **Develop Advanced Airborne and Terrestrial 3-D Laser Recon Capability**
  - Mission Planning/Rehearsal
  - Intel. Prep. Battlefield
  - Live Situational Awareness
  - Force Protection
  - Precision Engagement
  - Battle Damage Assessment
- **Develop Rapid Processing Software for Airborne & Terrestrial Sensor Data**
- **Develop 3-D Visualization Software Blending Airborne & Terrestrial Sensor Data**
  - Exploit Emerging Computing/GPS/Comms Technology
    - ***PEO Soldier - Land Warrior***
    - ***USMC/SOCOM – Pathfinder ACTD***
- **Develop Urban Decision Aid Software**
  - Urban Mobility
    - Cover and Concealment
    - Obstacle Avoidance
  - Collateral Damage Avoidance
  - Sniper / Counter-Sniper
  - Drop/Landing Zone Sighting
  - Vulnerability Assessment

Perimeter Defense

Summary

ACTD Provides Warfighter with Revolutionary Urban Recon Capabilities

- Visualization:
  - Below the Roofline
  - Under the Canopy
  - Inside Buildings
- Live 3-D Situational Awareness Infrastructure Supporting:
  - Planning and Rehearsal
  - Live Mission Execution, Monitoring, and Individual Combatant Geo-Location
- Outmaneuver the Enemy

Warfighter Believes this Capability Will Revolutionize Urban Reconnaissance & Save Lives